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Dear Researcher,

Greetings!

Articles in this issue discusses about study endeavours to recent trends in computer science.

We look forward many more new technologies in the next month.

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SURVEY ON SOCIAL MEDIA IMPACTS IN STUDENTS EDUCATION

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Abstract – The social networking sites and social media have revolutionized the world, bringing us closer than ever before. However, students can exploit this and use it for a better life, a better tomorrow. It should be used to connect, stay in touch, share views but not waste time on. Today, the main aim of the student should be education and their future career. However, many students rely on the accessibility of information on social media. That means reduced focus on learning and retaining information. The study also points out the popularity of social networking sites among students community. This research tries to investigate about the benefits and the drawbacks of the social media use on student academic performance.

Keywords: Social media, Students, Machine learning

1. INTRODUCTION

The utilization of web-based entertainment has met extraordinary development since the expanded advancement in web innovation. Social media is a concept that has given people a common platform for sharing their news, views and opinions regarding the happenings around them. It is also being used by the advertisers and companies for their promotions, professionals for searching and recruiting, students for internships etc. The use of social media has met a great growth since the increase evolution in internet technology. They become very popular and play an important role in all domains of our lives especially in education. For this reason, in the last decade, researchers pay more attention for the use and the impact of social media on the educational operation. In fact, these social websites can be a good manner to exchange the information between students and even with their teachers. However, excessive

social media can affect the student academic performance and make this use in question.

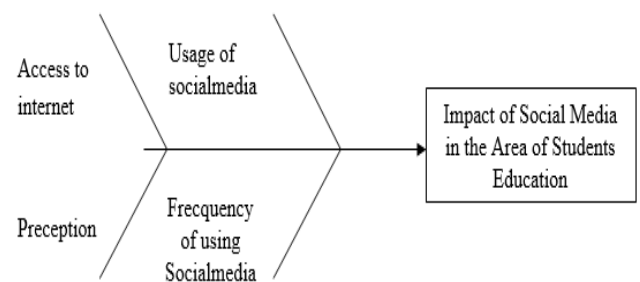


Fig 1.1 Impact of Socialmedia for Students

2. SURVEY ON SOCIAL MEDIA IMPACT

Basil C.E. Oguguo, Juliet O. Ajuonuma, Roseline Azubuike, et al. (2020). Social Media Questionnaire (SMQ) and Students' Accounting Achievement Proforma (SAAP) were used for data collection. Their result showed that students frequently engage in social media in order to make new friends [1].

R. Sivakumar. (2020). Random sampling technique was employed for sample selection. Subsequently, Statistical Technique was applied to analyze the data. It was concluded that in despite of public views concerning the misuse of social media among students in the society, most of the school students were interested to use social media positively for their academic purpose [2].

Samridhi Tanwar, et al. (2021). Importance of social media is an in-thing among the educational sector. These are computer-mediated tools that allow people or companies to create, share, or exchange information, career interests, ideas, and pictures/videos in virtual communities and networks. The social networking websites like linkedin, Facebook, twitter and orkut etc. are continuously distracting students from their studies. The main focus of student should be education [3].

Gilbert M. Talaue, Ali AlSaad, Naif AlRushaidan, et al. (2018). The study used the quantitative as well as qualitative methods of research. Descriptive research design was utilized to gain accurate profile of situation. information relevant to the study were obtained from both primary and secondary data. Primary data were acquired from the respondents of the study [4].

Hussein Altabrawee, Osama Abdul Jaleel Ali (2019) In this research, four machine learning techniques have been used to build a classifier that can predict the performance of the students in a computer science subject that is offered by Al-Muthanna University (MU), College Of Humanities. The machine learning techniques include Artificial Neural Network, Naïve Bayes, Decision Tree, and Logistic Regression. This research pays extra attention to the effect of using the internet as a learning resource and the effect of the time spent by students on social networks on the students' performance. These effects introduced by using features that measure whether the student uses the internet for learning and the time spent on the social networks by the students. The ANN (fully connected feed forward multilayer ANN) model achieved the best performance that is equal to 0.807 and achieved the best classification accuracy that is equal to 77.04% [5].

Isaac Kofi Nti, Samuel Akyeramfo-Sam, Bright Bediako-Kyeremeh, Sylvester Agyemang. (2021). are sampled using a convenient sampling technique to address the divergent views on social media use and academic performance in the literature. Also, predicted the student's GPA using a predictive framework based on Decision Tree (DT) and Random Forest (RF) machine learning algorithms [6].

Kiran Shahzadi, Muhammad Shahzad Sarfraz, Mazhra Saqib, et al. (2020). are using student-por.csv and student-mat.csv dataset and work on the classifier on the social media impact on students academic performances. For this purposes they choose K nearest-neighbor (KNN), support vector machine (SVM) and Linear regression algorithm using python that predict slightly better and give right prediction about the student's academic performance [7].

Miao Chen and Xin Xiao. (2022). are reviews the findings of the exemplary published works of research to shed light on the positive and negative potential effects of the massive use of social media on students' emotional well-being.

This review can be insightful for teachers who tend to take the potential psychological effects of social media for granted [8].

Monia Ouedera, Inam Abousaberb. (2018). A quantitative approach has been considered in this study by using a questionnaire distribution. The questionnaire was divided into two sections. The first one concerns with the personal data of the respondents such as gender, educational level and their study field [9].

Muhammad Hammad Musaddiq, Muhammad Shahzad Sarfraz, et al. (2022). are proposed methodology includes three experiments for the prediction of student performance. The first experiment used the Fuzzy Delphi Method (FDM) output for the prediction of student performance. The second experiment is applied to all the datasets having all academic features, locational features, and behavioural features. The last experiment applies different feature selection techniques to the complete dataset followed by a trial that tried to predict student performance [10].

Nawaf N. Hamadneh, Samer Atawneh, Waqar A. Khan, et al. (2022). Are present an approach of statistical analysis to identify the most common factors that affect the students' performance and then use artificial neural networks (ANNs) to predict students' performance within the blended learning environment. After that, proposed a new ANN model to predict the students' performance. Firefly Algorithm (FFA) was used for training the ANNs. The proposed model's performance will be evaluated through different statistical tests, such as error functions, statistical hypothesis tests, and ANOVA tests [11].

M. Owusu-Acheaw, Agatha Gifty Larson. (2015). Are used Questionnaire for collecting data. A set of questionnaire was designed by the researchers to collect information and data. The study concluded that most of the respondents visit their social media sites using their phones and spend between thirty minutes to three hours per day and that the use of social media sites had affected academic performance of the respondents negatively [12].

Pankaj Chaudhary, Rajat Sahani. (2017). are anonymous questionnaire was administered to collect data which was the standard survey collection method. There were three different perspectives present in the research which included advantage, disadvantage or not sure.

However, other independent variables were tried to decrease the impact on the results [13].

Rithika M, Sara Selvaraj. (2013). the primary data for this research study will be collected through a questionnaire the data of questionnaire was collected from 100 respondents. In addition, this collected data lead this research study to the exploration of the impact of social media on student's education performance. Judgement sampling has been used for data collection [14].

Shahzad khan. (2012). As study both primary and secondary sources of data has included. The primary data for this research has collected through questionnaire. The SPSS Software was used in this study for analysis of factors that determine the impact of social networking websites on students [15].

Shuping Li and Taotang Liu (201) The proposed method used deep neural network in prediction by extracting informative data as a feature with corresponding weights. Multiple updated hidden layers are used to design neural network automatically; number of nodes and hidden layers controlled by feed forwarding and back propagation data are produced by previous cases. The training mode is used to train the system with labelled data from dataset and the testing mode is used for evaluating the system. Mean absolute error (MAE) and root mean squared error (RMSE) with accuracy used for evolution of the proposed method. The proposed system has proven its worth in terms of efficiency through the achieved results in MAE (0.593) and RMSE (0.785) to get the best prediction [16].

Suchithra Rajendran, S Chamundeswari, Akhouri Amitanand Sinha. (2022). is used to predict the academic performance of middle- and high-school students using Machine Learning Algorithms (MACHINE LEARNINGAs) based on numerous socio-demographic, school-related, and student-related variables. The Grade Point Average (GPA), which is a reflection of academic performance, is considered to be the output [17].

Sunitha Kuppaswamy, et al. (2010). Are explore the impact of social networking sites on the education of youth. The study argues that these social networking websites distract students from their studies, but these websites can be useful for education based on sound pedagogical principles and proper supervision by the teachers. Moreover, the research concludes that social networking

websites have both positive as well as negative impact on the education of youth [18].

Tarek A. El-Badawy & Yasmin Hashem. (2015). Are distributed Questionnaires through the social media platform, Facebook and emails, amongst a sample of students. The data obtained was analyzed in several ways, with grouping the students with similar answers together, then applying the cross tabulation method to measure the impact and effect, first the frequency of the students usage of social media daily, against their overall grade average, and also the number of hours they spend daily on studying with the hours spent on social media [19].

Zahid Amin, Ahmad Mansoor, Syed Rabeet Hussain And Faisal Hashmat. (2016). Questionnaire was used as an instrument for data collection. 97% questionnaire received back from respondents on which descriptive statistics apply for data analysis. Results indicate that the effect of social media can be positive as in this study closely determined the real effect of social media sites [20].

3. COMPARISON OF VARIOUS TECHNIQUES USING OSN

R EF No	TECHNIQUE	POSITIVE IMPACT	NEGATIVE IMPACT	PERFORMA NCE
[1]	Machine Learning	Educational institutions to provide timely support and appropriate recommendations to students.	Students feel stress levels at the beginning and end of the semester.	It is a reflection of academic performance, is considered to be the model output.
[2]	MACHINE LEARNING (Decision Tree, Random Forest)	Student's Grade Point Average is positively increased.	Negative impact of the students academic achievements	Social networking site usage and multitasking strongly supports a negative consequence on students' academic performance.

[3]	MACHINE LEARNING (Naive Bayes, Decision Tree, Linear Regression, Artificial Neural Network)	Using these algorithm accuracy of the prediction is very good.	More time spent by the students on social networks	Decision tree model identified five factors as important factors which influence the performance of the students.	[9]	Fuzzy Delphi Method	Social media can help the to improve the student's academic performance	Support to student dropout the education	To highlight all important factors that has effects on student performance .
					[10]	K-Nearest Neighbour, Support Vector Machine	Strong relationship between social media and student's academic performance	The social media affect on student performance in educational activities.	The utilization of student's social networks on their educational activities.
[4]	Random Sampling Technique	Social networking websites can be useful for education	Social networking websites distract students from their studies	Social networking websites have both positive as well as negative impact	[11]	Blended Learning, Artificial Neural Network, Firefly Algorithm	To improve the learning process, and to reduce academic failure rates	It is the use only in the blended learning system phenomena.	It ensures that all students have good learning skills.
[5]	Random Sampling Method	Most of students use social networking websites for study	Negative impact noticed in the daily life that students become addicted to social networking websites	Mostly use social networking websites for entertainment.	[12]	Machine Learning	Students should be taught to use this social media in a better way in the educational classes.	Negative impact of the student should be education but unfortunately today's student are emphasizing on such sites which can be a complete wastage of time.	Social Networking web sites help in education by allowing students and teachers in one platform.
[6]	Correlation	Students using the social media to improve their knowledge.	Social media sites had affected academic performance of the respondents negatively	Introduction of students to the availability of novels and other information resources		Descriptive Statistics	Some of the social media seem to be the best social networks that improve the educational process	This social media can affect the student's educational.	Enhance the academic performance for the students by improving the use of the social media sites.
[7]	Qualtrics survey, Robust regression	Students use social media to multitask	It can distract from academic success, and at the same time facilitate social interaction and the development of social networks.	It can distract from academic success, and at the same time facilitate social interaction and the development of social networks	[13]				
[8]	Chi Square analysis	Social media has a positive impact on the development of the students' education.	Impact that is caused by social media on the students' academic performance	It is clear that social media does not impact school students academic performance in any way because although they spend hours on social media, they still manage to find time to study	[14]	Descriptive Statistics	Attention of students for study and affecting positively their academic Grade points.	usage of such social media have no negative effect on students grades.	The social media sites like Facebook, twitter, Google And Skype capture the attention of students for study and affecting positively.
					[15]	Standard Survey Collection	positive impact of social media can utilize the students for academic assistance and support etc.	Social media is negatively associated with grade points of the students.	This has revealed that college students were likely to be affected by social media.

[1 6]	Chi-Square	There is no positive impact from this study.	Students are becoming individualistic and that students become addicted to social networking websites.	It concludes with one should be cautious when using new technologies .
[1 7]	Slovin's Formula	Social media networks can positively help students improve in their academic pursuits.	The negative impacts of it on students is alarming as students tend to abandon their studies.	Social media have a dual impact on student achievement , and it is necessary to approach adolescents' use of social networks.
[1 8]	Random Sampling	From the study there was a strong positive relationship between the use of social media and academic performance.	Students who lack time management can easily fall prey to the negative impact of social media.	Students can use social media as teaching and learning tool to ease and improve learning process.
[1 9]	Traditional research methods	Impacts of social media on student life depend largely on the educational context.	Different affective factors such as anxiety, stress, self-esteem, and the like have a developmental nature.	The sorts of interventions needed to moderate the potential negative effects of social networking on them can be different too, all requiring a new line of research in education domain.
[2 0]	Traditional research methods	Impacts of social media on student life depend largely on the educational context.	Different affective factors such as anxiety, stress, self-esteem, and the like have a developmental nature.	The sorts of interventions needed to moderate the potential negative effects of social networking on them can be different too, all requiring a new line of research in education domain.

4. FINDINGS

This analysis indicates that more methods are used to identify the problem of the social media

in academic performance. MACHINE LEARNING (Naive Bayes, Decision Tree, Linear Regression, Artificial Neural Network) are provide solution for that problems. In more accurate solution will move on deep learning based analysis will provide accurate solution of the social media problem and their effects in studies.

5. CONCLUSION

The main purpose of this study was to analyze the use of the social media and its relationship with the academic performance among the students. According to the study, social network websites grab attention of the students and then diverts it towards non-educational and inappropriate actions including useless chatting. The past analyses are not provided efficient result. Future work will consider all major issues from social media and provide best solution with deep learning methods.

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INTERACTIVE EDUCATION IN E-LEARNING USING REALITY TOOLS

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Abstract – Present education that is sustained conventionally through technology has transitioned from e-learning to smart phone learning because of the everywhere being there of the Internet, as well as speedy advancements in Information and Communication Technology (ICT) and current improvements in learning technology with Augmented Reality and Virtual Reality tools. With the advent and widespread usage of smartphones and ubiquitous computing, the concept of E-learning has acquired new significance by giving consumers access to a wide range of options for interacting with e-learning mechanisms. It has also made it necessary for the syllabus designers of the course to pick the most appropriate technology from among the abundance of options available for distributing knowledge representation. This paper outlines state-of-the-art precious up-and-coming technologies A-R and V-R which are apt for carrying out various activities related to e-learning.

Keywords: Education, E-Learning, Augmented Reality, Virtual Reality, Information and Communication Technology

1. INTRODUCTION

The meaning of E-learning may be presented as a type of education by way of standalone computers, the Internet, smart phone or various networks. It encompasses the transfer of knowledge and skills (usually from a remoteness), and is in regards to the usage electronic processes and applications for learning. The e-learning industry, which includes Web-based learning, has been growing rapidly around the world in recent years. This growth is contributed in many reasons; these include environmental costs and impact that have been decreased, more affordable quality

education, and the flexibility and convenience that it gives to students.

A novel approach to e-learning that uses the Web as an interface for individual or group learning, supported by cutting-edge techniques and potent software because of the pervasiveness of the Internet. Web-based learning and new ideas related to it, such as virtual universities, laboratories, and classrooms, are introducing many new problems, nevertheless.

Within a decade, the Internet has become a pervasive medium that has changed completely, and perhaps irreversibly, the way information and knowledge are transmitted and shared throughout the world. The education community has not limited itself to the role of passive actor in this unfolding story, but it has been at the forefront of most of the changes. Indeed, the Internet and the advance of telecommunication technologies allow us to share and manipulate information in nearly real time. This reality is determining the next generation of distance education tools. Distance education arose from traditional education in order to cover the necessities of remote students and/or help the teaching-learning process, reinforcing or replacing traditional education.

The Internet takes this process of delocalization of the educative experience to a new realm, where the lack of presential intercourse is at least partially, replaced by an increased level of technology-mediated interaction. Furthermore, telecommunications allow this interaction to take forms that were not available to traditional presential and distance learning teachers and learners. This is E-learning (also referred to as web-based education and e-teaching), a new context for education where large amounts of information describing the continuum of the teaching-learning interactions are endlessly generated and ubiquitously available.

The creation of various kinds of environments for learning can be dependent on the target audience, learning objective, access (virtual, physical or both), and the kind of content to be presented. It is important to know how the learning environment will be utilized, and the impact of the equipment and methods that distinguish the various learning outcomes while the technology is evolving. The importance of emerging technologies, such as Augmented Reality and Virtual Reality is explained in detail in this survey paper.

2. AUGMENTED REALITY

AR is an interactive technology which enhance computer generated virtual model in real world .it de-rived its existence from virtual reality. In simple words augmented reality is nothing but augmenting virtual object in real world registered in 3D and the virtual object interacts with real environment. Augmented reality has the features of combining virtual and real objects in a real space, registered in 3D and interactive in real time, normally Graphical User Interface (GUI) has some Limitations like gap between computer and real world, explicit operations etc.. In order to overcome these problems computer augmented has been evolved.

AR technology causes people to feel charmed from the first time of their involvement. In theory, augmented reality began to be creatively invented at 1960s. It is necessary to understand the working processes AR. Here a 3D model will be augmented into real world. Augmented Reality is closely tied with Virtual Reality since the concept of AR is an extension from VR where VR is a virtual environment generated by computer models in which we can't see the real world we will be in virtual world created by computer. Extending these concept the virtual object is integrated with real world so that the user can see the virtual object and real world and virtual object is enhanced with the real world.

Recent developments made augmented reality more interesting by introducing marker less augmented reality in which we don't need marker to specify the place for augmenting virtual object. It projects the virtual object as programmed for a specific object or location. This made mobile augmented reality more interesting as we can view about entire location without need of any markers. For example a user want to know about hotels in his place he can view from his mobile placing the

mobile cam at a building or at a place he can view the hotels near by with navigation using GPS, he can view the history if that place or any interesting aspects about that place this type of applications are very useful for tourists when they are in new place.

3. AUGMENTED REALITY IN EDUCATION

Education system is modernizing day by day with the use of recent trends in technologies starting from normal board room teaching to projector presentation. Right now teaching field depends on PowerPoint presentations with animations to make students interesting and to understand concepts more effectually. Using the concept of augmented reality we can create markers of 3d models and we can project them to students.

Recent trends in technology made new gadgets like iPhone, iPad, android devices, tabs made eBooks as a part of their educations in some colleges and schools encouraging eBook reading. In china and japan iPad are used for studying. Now usage of gadgets increasing day by day it mark up for augmented reality in the field of education. We can operate augmented reality using this gadgets so many companies are making augmented reality apps for games and advertising. The birth of AR in education take place at 2002 in which hitlab made an augmented reality method of storytelling.

The work carried out in different phases starting with sketching the animation the story is divided into different modules and in which a document is prepared on that story with basic requirements and sketching is done for each scenario so step 1 is creating a story board roughly sketching out what was going to be shown on each page of the book. These sketches showed important things such as who the characters were in each scene, what they were doing, and where they were placed relative to each other.

The storyboard was drawn several times before the final sets of pictures were selected. Second step was 3d modelling the process of modelling involves making a 3D model from picture. They used special computer modelling software to create and colour 3D objects they worked particularly hard to make sure that the virtual images looked exactly like sketched pictures. This was helped by using scans of parts of the pictures and applying these scans as textures on the virtual images.

The final outcome was a set of computer generated 3D scenes that looked very similar to sketched illustrations. Moving on to the step three the completed 3D models animated using some animation software's according to the story and it's just like making an animation movie of storytelling and step four nature feature tracking makes the animated computer model to be augmented in a book animated using augmented reality software.

It projects the model in 3D such that we feel the real story experience in 3 dimensional view of approach finally a finished project is viewed by handheld devices or head mounted displays. Getting basic knowledge from this so many companies starting making apps on these technology recent trends in mobile computing made augmented reality more expandable such that we can use mobile based augmented reality for studying purpose and understanding the tough concepts easily.

4. VIRTUAL REALITY

All VR technology is capable of constructing a user-centered, 3D environment that is familiar to the student onto which abstract and complex information can be imposed. This virtual environment can stimulate interactive learning and comprehension, which are essential in engineering education. Despite these advantages, there are several barriers to the use of VR in engineering education, including a lack of simple, easy-to-use, low cost software that can enable the instructor to build virtual environments for educational use. In this paper, we discuss our experiences in developing a virtual education program in biotechnology for Indian Hills Community College.

VR includes the development of VE-Suite, an extensible, cross-platform, open source, freely download-able library of tools that enable engineering education in a virtual environment. Using this software, a virtual fermentor was developed, which not only allows students to explore the inner workings of the fermentation tank, but also to be able to simulate the fermentation process so they can test-run the virtual fermentor by varying the operation parameters and observe the results instantly. Finally, a human factor experiment was conducted to study the effectiveness of different data visualization methods that should be used in the

virtual fermentor at facilitating students' self-paced learning.

5. VIRTUAL REALITY IN EDUCATION

The VR enables learners to be immersed in learning scenarios. They can train in environments by immersing themselves in lifelike situations which are otherwise too dangerous (e.g. chemistry experiments), which would result in terrible consequences (e.g. simulation of a surgery), which are too expensive (e.g. complex laboratory setup), or which are hard or even impossible to reproduce.

Several studies have shown the potential of immersion in digital learning scenarios. The added values of immersion are, for instance, the support of multiple perspectives, situated learning, and transfer. The additional dimension of immersion provided by fully immersive VR environments with HMDs has been shown to support the knowledge structure. Coulter, Saland, Caudell, Goldsmith, & Alverson have shown in a study that learners show a significant knowledge gain when using VR learning scenarios compared to computer-screen based (partially immersed) learning settings.

1) Medical Training: A Medical students usually have the opportunity to watch real surgeries during their education. However, the number of spectators in an operating room is strictly limited. Therefore, the students only have a few chances to get familiar with the actions and procedures in an immersive and realistic environment. VR as a tool for training students in the medical field might be the solution. Different approaches use 360-degree pre-recorded images or videos of operating rooms during surgeries to create educational learning environments in VR.

As a result of this, the spherical recording of the operating room allows for better observation compared to traditional video recordings because the view of the user is not limited to a specific camera angle. Some approaches go even further and enable the interaction of the user with the environment. In these cases, computer-generated components are often inserted into the environments which were created with 360-degree photorealistic content

2) Nurse Education: Different forms of simulations for nurse education have evolved over the last five decades. With this, earlier training models like role-playing have been extended or replaced by new forms of simulations that make

use of games, computer aided instructions, or VR. In some countries like Sweden, extreme catastrophic situations are rare. Still, it is crucial to prepare emergency personnel for different catastrophic situations to maintain their competence. To address this challenge, 360-degree video can be used to expose nursing students or trauma teams to immersive learning environments showing simulated scenes in different conditions and places. Another approach is to let nursing students experience different disabilities in VR to become aware of the patient's situation. One disability known as macular degeneration can be visualized by darkening areas of the user's view in the virtual environment.

3) Safety Training: The usage of VR is not only possible for areas where the cost is surpassing the average by far, but also for fields that bring along hazardous working conditions and where the effort to conduct training is immense. VR safety training allows areas like the mining industry or the construction industry to lower their expense while being more effective and improving safety. Another possible domain of application is for earthquake safety training, where users are made aware of potentially dangerous situations and how to handle them. Training like this can also be applied in terms of schools, where road or pedestrian safety is a significant factor in order to improve street crossing behavior.

4) Teacher Education: Videos can help teachers to facilitate reflection on their teaching style and practice. VR in combination with 360-degree content is a powerful tool for teacher education as well. 360-degree recordings of classrooms can be used by pre-service teachers to learn about the classroom situation and analyze the students' behavior. Also, it enables them to learn how to reflect on specific teaching situations. Such enhanced observations are not possible with standard videos as the view is limited by the angle of the camera, and exploring the whole situation is therefore often not possible.

5) Sports Training: Watching recorded processes of the own performance is not only used in the classroom but also, for instance, in professional sports training. Immersive learning has also been shown to be successful for training quarterbacks and helping them to immerse

themselves in their past games and rethink decisions they have made during the game.

6. CONCLUSIONS

Immersion is an essential factor in improving learning experiences and enables learners to experience scenarios that are usually hard or impossible to experience. VR experiences can help learners to focus on the learning elements entirely, they keep them engaged, and their understanding can be improved by being virtually present in learning scenarios. In this paper, we have discussed different immersive learning experiences and applications with a focus on real VR experiences. The main application domains for educational scenarios include virtual tours, which are often expensive or impossible to make, such as tour through a museum, a historical landmark, or the space.

Use of technology is not limited to one field augmented reality has so many uses in field of education and making an AR textbooks can enhance the present education system and use of recent trends in technology and by publishing AR textbooks and providing AR software's in mobile phone based on android, ios etc. enables the augmented learning platform to the students in any subject and make an mind blowing presentation about the concept. The future of the world depends on the education. Finally augmented reality can be used in education field and making AR textbooks enhance its involvement in education field.

The interactive learning media development model with augmented reality, using Imagineering process for SMART classroom, consisting of the elements of interactive learning media development model with augmented reality using Imagineering process for SMART classroom include 5 factors: people ware, software, hardware, procedure and data and information. The activities of interactive learning media development model with augmented reality use Imagineering process for SMART classroom.

The results of this paper correspond with virtual technology likely to become a standard component of education. In addition, this work discusses the features of augmented reality technology as a technology that helps teachers to explain abstract topics more effectively, which is consistent with the results of this research, that augmented reality technology enhances learning efficiency and allowing students to understand abstract content

by using less learning time. In this paper, found that augmented reality technology and Imagineering process are flexible in teaching and learning. They can be adapted to various teaching methods and contexts that use augmented reality technology for learning in the SMART classroom as a learning source database and used to review knowledge as a teaching media for students to create work pieces.

VR (real VR and also simulated experiences) have a high potential to change the way we will learn in the future, either in a self-directed way or also in classroom settings.

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A SURVEY ON LUNG DISEASES IDENTIFICATION USING MACHINE LEARNING

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Abstract – In the medical world, lung cancer is considered one of the most dangerous diseases. The most observable area of research for medical professionals from the beginning to the present has been lung cancer analysis. The signs of lung cancer usually don't appear until the disease has spread. This is where medical attention becomes most challenging. Early identification of lung cancer is essential since the disease progresses quickly. Nowadays, machine learning algorithms play an important role in the prediction and classification of medical data. Various machine learning algorithms are used for detecting several diseases. A chest X-ray and Computed Tomography (CT) image can be used to classify and organise lung nodules, as well as determine their risk level. It gives a clear picture of the affected area, monitors its progression, and shows chronic lung conditions, as well as complications related to these conditions.

Keywords: Lung cancer, Machine Learning, Computed Tomography, Classification

1. INTRODUCTION

The lungs are the primary organs of the respiratory system in humans. Humans have two lungs, one on the left and one on the right. They are situated within the thoracic cavity of the chest. The right lung is bigger and heavier than the left, which shares space in the chest with the heart. The lungs have a unique blood supply, receiving deoxygenated blood from the heart in the pulmonary circulation for the purposes of receiving oxygen and releasing carbon dioxide, and a separate supply of oxygenated blood to the tissue of the lungs, in the bronchial circulation. The tissue of the lungs can be affected by a

number of respiratory diseases, including pneumonia and lung cancer. Lung cancer, also known as lung carcinoma is a malignant lung tumor characterized by uncontrolled cell growth in tissues of the lung. Lung carcinomas derive from transformed, malignant cells that originate as epithelial cells, or from tissues composed of epithelial cells. Other lung cancers, such as the rare sarcomas of the lung, are generated by the malignant transformation of connective tissues which arise from mesenchymal cells. Most cancers that originate from within the lungs, known as primary lung cancers, are carcinomas. The two main types are small-cell lung carcinoma (SCLC) and non-small-cell lung carcinoma (NSCLC).^[3]

The most common symptoms are coughing (including coughing up blood), weight loss, shortness of breath, and chest pains. Early lung cancer often has no symptoms. Lung tumors also often cause the release of body-altering hormones, which themselves cause unusual symptoms, called paraneoplastic syndromes.

A person suspected of having lung cancer will first have various imaging tests done to evaluate the presence, extent, and location of tumors. First, many primary care providers perform a chest X-ray to look for a mass inside the lung.^[23] The x-ray may reveal an obvious mass, the widening of the mediastinum (suggestive of spread to lymph nodes there), atelectasis (lung collapse), consolidation(pneumonia)or pleural effusion^[13] however, some lung tumors are not visible by X-ray. Next, many undergo computed tomography (CT) scanning, which can reveal the sizes and locations of tumors. The medical image requires obtaining the insight value, analysing it, and then diagnosing the specific disease. Several Computer-Aided Diagnosis (CAD) systems are being developed for detecting cancer at an early

stage. It aids radiologists in reducing errors and misinterpretations. But the CAD systems developed for detecting the cancerous tumour that fully automate cancer detection by displaying the tumour region are required. (Figure 1) shows the parts of the lung.

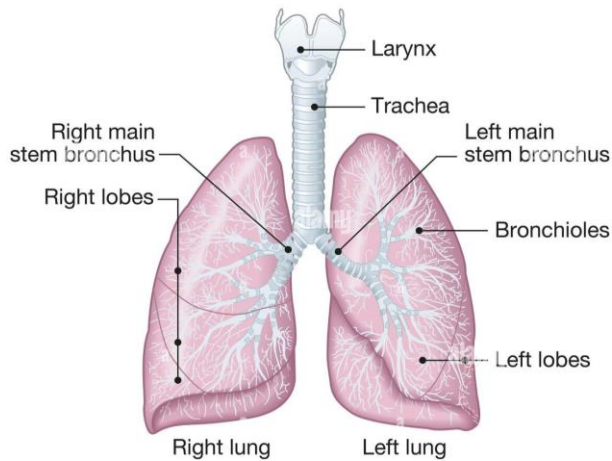


Fig 1. Lung image with parts

2. REVIEW OF LITERATURE

In this paper the literature review provides necessary knowledge to measure concept of several machine learning techniques used in lung cancer detection and to improve the performance of the prediction of lung cancer in health care system.

Prof . S. U. Bohra et al[1] proposed ,”Lung Cancer Disease Diagnosis Using Machine Learning Approach” on machine learning approach to diagnose metastatic tumor at initial stage itself using Convolutional Neural Network(CNN) method. This model comprises some phases such as Image Filtering, Feature Extraction, Segmentation, Edge Detection, and Feature Recognition. CT scan images are considered for this ongoing research work. This work also used Tensor Flow for numerical Computation; Python has rich set of predefined machine learning Library, and Open-CV image processing library used for image related functionalities. The approach of profound neural system is utilized to achieve more accurate precision in discovery of lung malignancy and precisely anticipate stages.

Michael K. Gould et al [2] proposed ”Machine Learning for Early Lung Cancer Identification Using Routine Clinical and Laboratory Data” to develop a model to predict a future diagnosis of lung cancer on the basis of

routine clinical and laboratory data by using machine learning. This method performed a retrospective study of case patients with Non-Small Cell Lung Cancer(NSCLC) subjects and compared the accuracy of a novel machine learning model by using the Area Under the receiver operating characteristic Curve (AUC), sensitivity, and diagnostic Odds Ratio (OR) as measures of model performance. This paper concluded a machine learning model was more accurate for early diagnosis of NSCLC and to help prevent lung cancer deaths through early detection.

Lingming Yu et al[3] focused multiple machine learning algorithms based on CT image to explore imaging biomarkers, that can be used for diagnosis and prediction of pathologic stage in Non-Small Cell lung Cancer (NSCLC).This work generated a new dataset and achieved equilibrium of class distribution by using Synthetic Minority Oversampling Technique (SMOTE) algorithm. The performance of prediction model in training and testing sets were evaluated from the perspectives of classification accuracy, Average Precision (AP) score and precision-recall curve. The predictive accuracy of the model was externally validated using Lung Adenocarcinoma (LUAD) and Lung Squamous Cell Carcinoma (LUSC) samples. This work concluded that the application of machine learning algorithms in CT image feature prediction for pathologic staging and identify potential imaging biomarkers that can be used for diagnosis of pathologic stage in NSCLC patients.

Pragya Chaturvedi et al[4] proposed a machine learning technique to find lung disease using Computer-Aided Detection (CAD) technology. This work help to detect cancer by feeding in certain inputs containing patient-related information such as CT-Scan, X-Ray, MRI Scan, unusual symptoms in patients. Support Vector Machine(SVM), Convolutional Neural Network(CNN), Artificial Neural Network(ANN), Watershed Segmentation, Image enhancement, Image processing are a few methods used to improve the accuracy and aid the process.

Ying Xie et al.[5] proposed a pioneering interdisciplinary method to detect early lung cancer. By combining metabolomics and machine learning methods, potential metabolic biomarker combination schemes based on logistic regression analysis were tested in order to improve the sensitivity and accuracy of early stage lung cancer

diagnostics. Metabolic biomarkers demonstrate significant diagnostic strength for early detection of lung tumours. The six machine learning techniques of K-nearest neighbour with the 10-cross fold technique were used for the early lung tumour prediction based on the metabolomic biomarker features. In addition, to identify the metabolites whose levels change with tumour stage progress, the Kruskal–Wallis test was applied. According to these results, we recommended the specific combination of these six metabolites as a screening biomarker for the early detection of lung tumours.

Kanchan Pradhan et al[6] presented “Medical Internet of things using machine learning algorithms for lung cancer detection” to study multiple machine learning methodologies suitable for detection of lung cancer associated with IoT devices. The research has concentrated on different machine learning approaches utilized to detect many diseases for search to a gap in future enhancement to predict lung cancer. . Each and every method was examined and the entire challenges were mentioned. The performance metrics were specified with its simulation platforms. The dataset utilized to predict the related diseases was also examined.

SurenMakaju et al[7] proposed “Lung Cancer Detection using CT Scan Images”. The proposed system is used to detect the cancerous nodule from the lung CT scan image using watershed segmentation for detection and SVM for classification of nodule. Proposed model detects the cancer higher than current model. Firstly, in image pre-processing median filter is used on grayscale image of CT scan images. Segmentation help in acquiring the region of interest in the image. Support Vector Machine (SVM) is used to classify nodule as malignant or benign. Increase in accuracy of cancer nodule detection than the best current model. Classifies the detected lung cancer as malignant or benign. Removes salt-pepper noises and speckle noise that creates false detection of cancer.

Meraj Begum Shaikh Ismail[8] proposed various machine learning algorithms to find out the early stage of lung cancer and explore the accuracy level. In the first stage of this system used image processing techniques to extract lung regions. The segmentation is done using K-means. The features are extracted from the segmented images and the classification is done

using various machine learning algorithm. The performance of the proposed approaches were evaluated based on their accuracy, sensitivity, specificity and classification.

3. CONCLUSION

Due to the shape of cancer cells, where the majority of them overlap one another, hence lung cancer prediction is the most difficult problem to solve. If treatment for lung cancer is delayed, there will be a significant increase in the risk of death. If cancer is detected and treated early enough, it is possible to cure it. The majority of lung cancer prediction, early detection, and lung cancer prevention treatments employ machine learning techniques. This paper gives a thorough analysis of prior research using machine learning approaches to predict lung cancer. An accurate lung cancer classification and prediction enabled by machine learning technologies. A machine-learning algorithm trained to predict cancer outcomes and a powerful tool that can help in rendering medical diagnoses, machine learning could detect diseases earlier using various techniques. The accuracy rate can be raised and there are fewer errors as a result of the pre-processing, classification, segmentation and feature extraction. This study gives best way for the doctors to prepare a better prescription and present the patient with an earlier diagnosis. Machine learning is proven to be the best method for medical image processing, lung nodule detection and classification, feature extraction, and lung cancer stage prediction.

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A STUDY ON CONTENT-BASED IMAGE RETRIEVAL TECHNIQUES IN COLLABORATION WITH MACHINE LEARNING

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Abstract – Image is one of the multimedia content which has fast-paced growth due to social media and the significant aspect is analyzing and retrieving the images for all sorts of cases in real-time application. Image Retrieval (IR) is the strenuous research field that leads Content-Based Image Retrieval (CBIR) techniques to another level. CBIR is the proficient framework that bridges the semantic gap between the high-level image interpretations of humans and the low-level image features stored in the database. It works competently in succeeding furtherance of database technology and searching methods when combined with Machine Learning (ML) types such as Neural Network (NN) and Deep Learning (DL) techniques. It depicts the uplifting performance as it classifies the objective features and does efficient extraction. This survey gives a detailed look at long-standing to most recent works which impart knowledge about techniques and evaluation methods used in the CBIR system for the natural images. This survey assesses the strategies/methodologies of each paper in terms of performance evaluation metrics and presents its pros and cons. This study enlightens proficiency of machine learning methods and their role of classification in the feature extraction, similarity matching, retrieval performance in the image retrieval field to commence a novel CBIR framework with new ideation and zeal.

Keywords - Image Retrieval (IR), Content-Based Image Retrieval (CBIR), Machine Learning, Neural Network, and Deep Learning.

1. INTRODUCTION

In image retrieval field, the Content-Based Image Retrieval (CBIR) is one of the fast paced growing sectors. The CBIR system makes the way of gathering information easier through visual content. It plays vital role on a daily basis in people's life in various factors, i.e. academics, commerce, fashion, etc. The main elements/features of the CBIR system are its color, shape, and texture attributes. So, the way of classifying/extracting the features from the image and comparing the similarity between the images is seem to be the fundamental functions of the CBIR system. The multi-features i.e. texture, edge, color, pattern, color, etc has been extracted using machine learning techniques. The extraction of multi-features reflects the diverse characteristics of the image [1]. Since the CBIR system has semantic gap issue, the well trained neural network combining supervised learning system and in-depth texture analysis have aided to achieve the efficient multi-feature extraction along with correct semantics association [2]. The CBIR system using the Artificial Neural Network (ANN) shows that even single combined feature vector could derive effective retrieval results in pre-trained neural network model than the multi-trained neural network models [3]. The deep learning being a part of machine learning system handles the process of representing image features and measuring differences of among the massive image database in simpler way [4]. The issues regarding semantic gap and the classification on dealing with massive image database is overcome by the pre-clustering the database and features obtained through the pre-trained deep learning model [5].

2. CBIR Techniques using Neural Network and Deep Learning

CBIR system is designed with neural network gives frameworks the capability to memorize without being unequivocally modified. It uses training sets. The deep learning architectures are used to model high-level abstractions in data. Deep learning techniques enable the system to learn complicated functions. The following approaches illustrates the uniqueness and efficacy of the NN and DL based CBIR system in a variety of areas, including storage, feature extraction, matching, preserving, classification and generation.

J. Han et al. [6] described a memory learning employed framework for effective image retrieval. The knowledge memory model forms semantic information storage. A learning strategy predicts the semantic relationships among images according to the memorized knowledge. This method is well-known for its ability to efficiently annotate images. CBIR-MLEF is the acronym for this study.

D. Picard et al. [7] explain an active learning strategy for searching images over networks. The reinforcement-based learning strategy learns the relevant images localization. The notable point of this system is the localization of the relevant images leads to a significant improvement in distributed CBIR. CBIR-ALS is the acronym for this study.

Ing-Sheen Hsieh et al. [8] designed a color image retrieval system using a region-based model and multi-classifier. Three complementary region-based classifiers are involved in the classifier selection stage which conveys the main features of color images. The flexibility in retrieval rules uplifts the system performance. CBIR-RMMC is the acronym for this study.

M. Broilo et al. [9] presented a semi-supervised stochastic image retrieval method that aids to overcome the optimization problem in image retrieval. The iterative supervision of the classification uses the user interaction with the machine. CBIR-SSSIR is the acronym for this study.

Yi Yang et al. [10] designed the Local Regression and Global Alignment (LRGA) framework for multimedia content analysis and retrieval. This method ranks the multimedia data and refines its semantics. The unified objective function aligns with the local regression model.

Short-term and long-term Relevance Feedback (RF) algorithms improvise the retrieval process. CBIR-LRGA is the acronym for this study.

X. Lu et al. [11] explained a latent semantic minimal hashing algorithm that generates the most appropriate semantic-preserving binary codes concerning query images. The method uses matrix factorization to learn the latent semantic feature while minimizing the binary quantization loss with an orthogonal transformation simultaneously. The distinction of this algorithm is that it achieves promising hashing performance even in a large margin. CBIR-LSMH is the acronym for this study.

L. Zhu et al. [12] expose the Semantic-Assisted Visual Hashing (SAVH) method leverages the associated texts of images to assist the visual hashing using unsupervised learning. This method extracts the semantics automatically from the noisy associated texts and enhances the discriminative capability of hash codes. CBIR-SAVH is the acronym for this study.

T.-T. Do et al. [13] draw out an embedding method for the image retrieval problem. This method maps local features unfolding an image to a higher dimensional representation. Fast Embedding Based on Function Approximation (F-FAEMB), in which the embedded vectors efficiently computes large scale retrieval. The advantage of this method is enhanced retrieval performance. CBIR-FFAEMB is the acronym for this study.

S. Wei et al. [14] reveal two-stream attentive CNN known as Main and Auxiliary CNNs (MAC), for image retrieval. It engages salient information into image retrieval in self-learning in an optimal manner. The mainstream is used for semantic feature extraction. An auxiliary stream is set for saliency prediction. Both streams are initialized, fused and fine-tuned on image retrieval datasets to improvise the capability of capturing inherent query intention. CBIR-MACNN is the acronym for this study.

W. Wei et al. [15] draw out a color image retrieval algorithm based on quaternion and deep features for efficient feature extraction and multi-feature fusion. The algorithm extracts the traditional features of the latest quaternion correlation matrix containing information entropy. The deep features fusion method manages the feature dimensions. Finally, the Euclidean distance measures the similarity between feature

vectors to obtain image retrieval results. CBIR-QDFCIR is the acronym for this study.

Y. Liu et al. [16] divulged a Deep Self-Taught Hashing algorithm (DSTH) to apply deep hashing on datasets without labels. This unified algorithm works with both supervised and unsupervised scenarios. It uses two different deep learning frameworks that train hash to deal with the out-of-sample problem and reduce the time complexity. CBIR-DSTH is the acronym for this study.

Z. Zhang et al. [17] divulged the Improved Deep Hashing Networks (IDHN) model to enhance the ability of multi-label image retrieval. It measures the fine-grained pairwise similarity and effectively encodes the details of fine-grained multi-label images. CBIR-IDHN is the acronym for this study.

M. Lin et al. [18] revealed the Similarity Preserving Linkage Hashing (SPLH) scheme for online image retrieval. It trains the latent linkage space which relationship among different semantic concepts as well as preserves the neighboring data points' semantic similarity. It involves an iterative alternating optimization approach to enhance its efficiency. CBIR-SPLH is the acronym for this study.

L. Ma et al. [19] defined a Correlation Filtering Hashing (CFH) method for fine-grained image retrieval. It estimates the object region at multiple scales and captures subtle differences from fine-grained objects. The advantage of this method is its effective hashing process in fine-grained image retrieval tasks. CBIR-CFH is the acronym for this study.

P. Staszewski et al. [20] provided an image descriptor generation method for an effective CBIR process. This descriptor contains information from activations of both convolutional and fully connected layers of the network. The retrieved images from the dataset match the query image semantically as well as concerning other characteristics. CBIR-IDG is the acronym for this study.

X. Dong et al. [21] divulged the Unsupervised Deep K-means Hashing (UDKH) method to simultaneously alleviate the problems of image retrieval and clustering within a single learning framework. This unsupervised deep hashing method integrates feature learning, hashing learning and clustering to solve both tasks

concurrently. CBIR-UDKH is the acronym for this study.

Yun et al. [22] draw out the pairwise context similarity method to alleviate the limitations in image retrieval such as scarce hash code diversity and low performance on misclassified images. The unsupervised trained Variational Auto-Encoder (VAE) computes the pairwise context similarity in the latent space. The prominence of this method is its efficient problem solving regarding pairwise label similarity. CBIR-PCS is the acronym for this study.

3. Scrutinies and Confabulation

This section holds the illustration of analysis on papers considering few important decisive factors which are merits, demerits, databases. The key point of this analysis is how the most recent ML techniques have an impact on the CBIR system. The performance is evaluated based on analyzed data and been discussed the methods which outperform in various aspects.

TABLE 1. ANALYSIS ON MERITS AND DEMERITS

S.No.	Methods	Pros	Cons
1	CBIR-MLEF[6]	Efficiently annotate the images	Lack of sufficient theoretical justification
2	CBIR-ALS[7]	Localization of the relevant images	Deficiency of managing concurrent queries of different concepts
3	CBIR-RMMC[8]	Amenable retrieval rules uplift the system performance	Distortion in image representation and its inaptness to line drawing images
4	CBIR-SSSIR[9]	Interactive nature of the scheme that renews supervising knowledge	Absence of standardized methodologies that need for user satisfaction measurement
5	CBIR-LRGA[10]	Precision, robustness, scalability and computational efficiency	High time complexity
6	CBIR-LSMH[11]	Achieves promising hashing performance even in a large margin	Vague interference in the retrieval result
7	CBIR-SAVH[12]	Adaption of the simple linear projection leads the hash code generation, faster retrieval process, and less storage cost	Unstable performance due to bits-uncorrelated constraint in hash code learning
8	CBIR-FFAEMB[13]	Enhanced retrieval performance	High time complexity

9	CBIR-MACNN[14]	Better performance on image retrieval using different classified datasets	Inability to extract more discriminative features for outdoor scenes
10	CBIR-QDFCIR[15]	Its time and space efficiency	Feature extraction that undermines dealing with certain databases
11	CBIR-DSTH[16]	Generating hash labels with guaranteed precision under no label conditions	Need of huge data collection for the training set
12	CBIR-IDHN[17]	Its effective feature learning and hash-code learning	High time consumption and handle only low-resolution images
13	CBIR-SPLH[18]	Iterative alternating optimization approach enhances efficient performance and effective scalability	Time and structural complexity
14	CBIR-CFH[19]	Its effective hashing process in fine-grained image retrieval tasks	It backslides on dealing with large-scale fine-grained image datasets
15	CBIR-IDG[20]	Its significant image comparison quality	Unapt results when it copes with semantic analysis
16	CBIR-UDKH[21]	It outperforms even in large scale image retrieval	Its uncertainty in the selection of the suitable cluster number
17	CBIR-PCS[22]	Its efficient problem solving regarding pairwise label similarity	Time complexity

9	CBIR-MACNN[14]	Paris, UkBench, Flower and Bird	Excellent
10	CBIR-QDFCIR[15]	University of Kentucky Benchmark, INRIA Holidays and Oxford 5k	High
11	CBIR-DSTH[16]	Oxford Buildings, INRIA Holidays, and Flickr Logo32	High
12	CBIR-IDHN[17]	NUS-WIDE, Flickr, VOC2012 and IAPRTC12	High
13	CBIR-SPLH[18]	CIFAR-10, Places205 and MNIST	High
14	CBIR-CFH[19]	CUB-200-2011 and Stanford Dogs	High
15	CBIR-IDG[20]	IMAGENET1M	Excellent
16	CBIR-UDKH[21]	CIFAR10, FLICKR25K, NUS-WIDE and MNIST	Excellent
17	CBIR-PCS[22]	CIFAR-10, NUS-WIDE, and MIRFLICKR25k	Excellent

Table 1 and 2 portrays the notable attributes namely, merits, demerits, database, and performance of the machine learning based CBIR methods. It outlines the clear view of how the method works and optimizes the overall CBIR system performance. The optimized retrieval performance, feature extraction, and scalability are the significant factors of the existing systems. However, some typical complexities related to structure, time, computation and database resides along with the optimized system. Image databases plays an unique role in CBIR system because the retrieval results have the effect of how and what type of database the system processes in the framework. Corel, Flickr, CIFAR, MNIST, etc are the widely used natural databases.

TABLE 2. ANALYSIS ON FEATURES AND DATABASES USED

S.N o.	Methods	Database Used	Performance Evaluation
1	CBIR-MLEF[6]	Corel Image Gallery	Medium
2	CBIR-ALS[7]	Trecvid 2005 Keyframe Dataset and COREL	Medium
3	CBIR-RMMC[8]	First database contains 183 flag images and second database contains 155 trademark images	Medium
4	CBIR-SSSIR[9]	Caltech-256 and Corel Photo Galleries	Medium
5	CBIR-LRGA[10]	Corel	Medium
6	CBIR-LSMH[11]	MNIST, Caltech, SIFT-1M and NUS-WID	High
7	CBIR-SAVH[12]	Wiki, MIR Flickr and NUS-WIDE	High
8	CBIR-FFAEMB[13]	INRIA holidays, Holidays+Flickr1M, and Oxford	Excellent

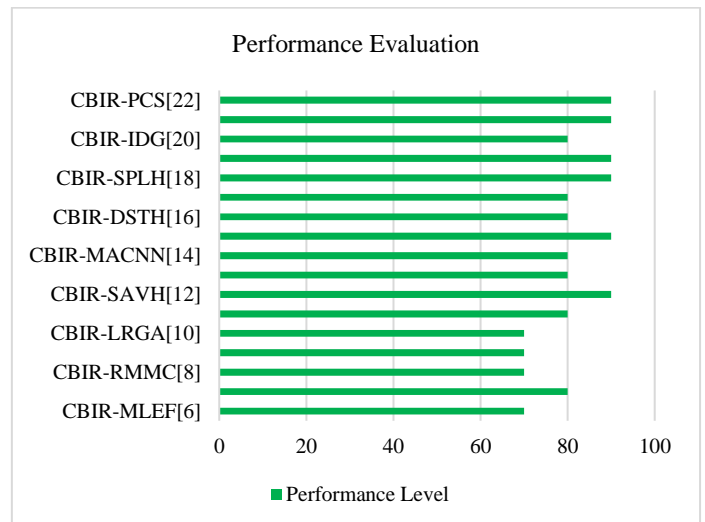


Fig. 1. Performance Evaluation

Fig.1. Illustrates the proficiency of the machine learning based CBIR systems considering its methodology and performance metrics. The CBIR-SAVH[12], CBIR-QDFCIR[15], CBIR-SPLH[18], CBIR-CFH[19], CBIR-UDKH[21], and CBIR-PCS[22] are the CBIR methods that performs better among the selected methods in terms of feature extraction and retrieval performance.

4. Conclusion

This study reveals many techniques and frameworks that lead to the advancement in a content-based image retrieval system. It reveals the exclusivity and worthiness of machine learning based CBIR methods/frameworks. The surveyed methods show how CBIR system acts with neural network and deep learning techniques. Each technique holds compelling methods for searching, indexing, matching, feature recognition, extraction, classification, optimization, and retrieval. This study shows the potential of the CBIR-CFH[19], CBIR-UDKH[21], and CBIR-PCS[22] methods reflecting the flexibility of the machine learning techniques adapting with leading-edge technology in all domains.

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